III.—

Jamaica ginger, ground	12 ounces
Lemon peel, fresh, cut fine	2 ounces
Capsicum, powder	1 ounce
Calcined magnesia	1 ounce
Alcohol, Water } of each	sufficient

Extract the mixed ginger and capsicum by percolation so as to obtain 16 fluidounces of water, set the mixture aside for 24 hours, shaking vigorously from time to time, then filter, and pass through the filter enough of a mixture of 2 volumes of alcohol and 1 of water to make the filtrate measure 32 fluidounces. In the latter macerate the lemon peel for 7 days, and again filter.

Ginger Beer.—

Brown sugar	2 pounds
Boiling water	2 gallons
Cream of tartar	1 ounce
Bruised ginger root	2 ounces

Infuse the ginger in the boiling water, add the sugar and cream of tartar; when lukewarm strain; then add half pint good yeast. Let it stand all night, then bottle; one lemon and the white of an egg may be added to fine it.

Lemon Beer.—

Boiling water	1 gallon
Lemon, sliced	1
Ginger, bruised	1 ounce
Yeast	1 teacupful
Sugar	1 pound

Let it stand 12 to 20 hours, and it is ready to be bottled.

Hop Beer.—

Water	5 quarts
Hops	6 ounces

Boil 3 hours, strain the liquor, add:

Water	5 quarts
Bruised ginger	4 ounces

and boil a little longer, strain, and add 4 pounds of sugar, and when milk-warm, 1 pint of yeast. Let it ferment; in 24 hours it is ready for bottling.

Œnanthic Ether as a Flavoring for Ginger Ale.—A fruity, vinous bouquet and delightful flavor are produced by the presence of œnanthic ether or brandy flavor in ginger ale. This ether throws off a rich, pungent, vinous odor, and gives a smoothness very agreeable to any liquor or beverage of which it forms a part. It is a favorite with "brandy sophisticators." Add a few drops of the ether (previously dissolved in eight times its bulk of Cologne spirit) to the ginger-ale syrup just before bottling.

Soluble Extract of Ginger Ale.—Of the following three formulas the first is intended for soda-fountain use, the second is a "cheap" extract for the bottlers who want a one-ounce-to-the-gallon extract, and the third is a bottlers' extract to be used in the proportion of three ounces to a gallon of syrup. This latter is a most satisfactory extract and has been sold with most creditable results, both as to clearness of the finished ginger ale and delicacy of flavor.

It will be noted that in these formulas oleoresin of ginger is used in addition to the powdered root. Those who do not mind the additional expense might use one-fourth of the same quantity of volatile oil of ginger instead. This should develop an excellent flavor, since the oil is approximately sixteen times as strong as the oleoresin, and has the additional advantage of being free from resinous extractive.

The following are the formulas:

I.—(To be used in the proportion of 4 ounces of extract to 1 gallon of syrup.)

Jamaica ginger, in fine powder	8 pounds
Capsicum, in fine powder	6 ounces
Alcohol, a sufficient quantity.	

Mix the powders intimately, moisten them with a sufficient quantity of alcohol, and set aside for 4 hours. Pack in a cylindrical percolator and percolate with alcohol until 10 pints of percolate have resulted. Place the percolate in a bottle of the capacity of 16 pints, and add to it 2 fluidrachms of oleoresin of ginger; shake, add 2½ pounds of finely powdered pumice stone, and agitate thoroughly at intervals of one-half hour for 12 hours. Then add 14 pints of water in quantities of 1 pint at each addition, shaking briskly meanwhile. This part of the operation is most important. Set the mixture aside for 24 hours, agitating it strongly every hour or so during that period. Then take

Oil of lemon	1½ fluidounces
Oil of rose (or geranium)	3 fluidrachms
Oil of bergamot	2 fluidrachms

Oil of cinnamon	3 fluidrachms
Magnesium carbonate	3 fluidounces

Rub the oils with the magnesia in a large mortar and add 9 ounces of the clear portion of the ginger mixture to which have been previously added 2 ounces of alcohol, and continue trituration, rinsing out the mortar with the ginger mixture. Pass the ginger mixture through a double filter and add through the filter the mixture of oils and magnesia; finally pass enough water through the filter to make the resulting product measure 24 pints, or 3 gallons. If the operator should desire an extract of more or less pungency, he may obtain his desired effect by increasing or decreasing the quantity of powdered capsicum in the formula.

II.—(To be used in the proportion of 1 ounce to 1 gallon of syrup.)

Ginger, in moderately fine powder	6 pounds
Capsicum, in fine powder	2½ pounds
Alcohol, a sufficient quantity.	

Mix, moisten the powder with 3 pints of alcohol, and set aside in a suitable vessel for 4 hours. Then pack the powder firmly in a cylindrical percolator, and percolate until 6 pints of extract are obtained. Set this mixture aside and label Percolate No. 1, and continue the percolation with 1½ pints of alcohol mixed with 1½ pints of water. Set the resultant tincture aside, and label Percolate No. 2.

Take oleoresin ginger 5 fluid ounces and add to Percolate No. 1. Then take:

Oil of lemon	1½ fluidounces
Oil of cinnamon	1 fluidounce
Oil of geranium	½ fluidounce
Magnesium carbonate	8 ounces

Triturate the oils with the magnesia, add gradually Percolate No. 2, and set aside. Then place Percolate No. 1 in a large bottle, add 3¼ pounds of finely powdered pumice stone, and shake at intervals of half an hour for six hours. This being completed, add the mixture of oils, and later 10 pints of water, in quantities of ½ a pint at a time, shaking vigorously after each solution. Let the mixture stand for 24 hours, shaking it at intervals, and then pass it through a double filter. Finally add enough water through the filter to make the product measure 24 pints, or 3 gallons.

III.—(To be used in proportion of 3 ounces to 1 gallon of syrup.)

Ginger, in moderately fine powder	8 pounds
Capsicum, in moderately fine powder	2 pounds
Alcohol, q. s.	

Mix, moisten with alcohol, and set aside as in the preceding formula; then percolate with alcohol until 10 pints of extract are obtained. To this add oleoresin of ginger 3 drachms, and place in a large bottle. Add 2½ pounds of powdered pumice stone, and shake as directed for formula No. 1. Then add 14 pints of water, in quantities of 1 pint at a time, shaking vigorously after each addition. Set the mixture aside for 24 hours, shaking at intervals. Then take:

Oil of lemon	1½ fluidounces
Oil of geranium	½ fluidounce
Oil of cinnamon	3 fluidrachms
Magnesia carbonate	3 ounces

Rub these in a mortar with the magnesia, and add 9 ounces of the clear portion of the ginger mixture mixed with 2 ounces of alcohol, rubbing the mixture until it becomes smooth. Prepare a double filter, and filter the ginger mixture, adding through the filter the mixture of oils and magnesia. Finally add enough water through the filter to make the final product measure 24 pints, or 3 gallons.

If these formulas are properly manipulated the extracts should keep for a reasonable length of time without a precipitate. If, however, a precipitate occur after the extract has stood for a week, it should be refiltered.

LEMONADES:

Lemonade Preparations for the Sick.—I.—Strawberry Lemonade: Citric acid, 6 parts; water, 100 parts; sugar, 450 parts; strawberry syrup, 600 parts; cherry syrup, 300 parts; claret, 450 parts; aromatic tincture, ad lib.

II.—Lemonade Powder: Sodium bicarbonate, 65; tartaric acid, 60; sugar, 125; lemon oil, 12 drops.

III.—Lemonade juice: Sugar syrup, 200; tartaric acid, 15; distilled water, 100; lemon oil, 3; tincture of vanilla, 6 drops.

IV.—Lemonade Lozenges: Tartaric acid, 10; sugar, 30; gum arabic, 2; powdered starch, 0.5; lemon oil, 6 drops; tincture of vanilla, 25 drops; and sufficient diluted spirit of wine so that 30 lozenges can be made with it.

Lemonade for Diabetics.—The following is said to be useful for assuaging the thirst of diabetics:

Citric acid	1 part
Glycerine	50 parts
Cognac	50 parts
Distilled water	500 parts

Hot Lemonade.—Take 2 large, fresh lemons, and wash them clean with cold water. Roll them until soft; then divide each into halves, and use a lemon-squeezer or reamer to express the juice into a small pitcher. Remove all the seeds from the juice, to which add 4 or more tablespoonfuls of white sugar, according to taste. A pint of boiling water is now added, and the mixture stirred until the sugar is dissolved. The beverage is very effective in producing perspiration, and should be drunk while hot. The same formula may be used for making cold lemonade, by substituting ice water for the hot water, and adding a piece of lemon peel. If desired, a weaker lemonade may be made by using more water.

Lemonades, Lemon and Sour Drinks for Soda-Water Fountains.—Plain Lemonade.—Juice of 1 lemon; pulverized sugar, 2 teaspoonfuls; filtered water, sufficient; shaved ice, sufficient.

Mix and shake well. Garnish with fruit, and serve with both spoon and straws.

Huyler's Lemonade.—Juice of 1 lemon; simple syrup, 2 ounces; soda water, sufficient. Dress with sliced pineapple, and serve with straws. In mixing, do not shake, but stir with a spoon.

Pineapple Lemonade.—Juice of 1 lemon; pineapple syrup, 2 ounces; soda water, sufficient. Dress with fruit. Serve with straws.

Seltzer Lemonade.—Juice of 1 lemon; pulverized sugar, 2 teaspoonfuls. Fill with seltzer. Dress with sliced lemon.

Apollinaris Lemonade.—The same as seltzer, substituting apollinaris water for seltzer.

Limeade.—Juice of 1 lime; pulverized sugar, 2 teaspoonfuls; water, sufficient. Where fresh limes are not obtainable, use bottled lime juice.

Orangeade.—Juice of 1 orange; pulverized sugar, 2 teaspoonfuls; water, sufficient; shaved ice, sufficient. Dress with sliced orange and cherries. Serve with straws.

Seltzer and Lemon.—Juice of 1 lemon; seltzer, sufficient. Serve in a small glass.

Claret Lemonade.—Juice of 1 lemon; pulverized sugar, 3 teaspoonfuls. Make lemonade, pour into a glass containing shaved ice until the glass lacks about one inch of being full. Pour in sufficient claret to fill the glass. Dress with cherries and sliced pineapple.

Claret Punch.—Juice of 1 lemon; pulverized sugar, 3 teaspoonfuls; claret wine, 2 ounces; shaved ice, sufficient. Serve in small glass. Dress with sliced lemon, and fruit in season. Bright red cherries and plums make attractive garnishings.

Raspberry Lemonade.—I.—Juice of 1 lemon; 3 teaspoonfuls powdered sugar; 1 tablespoonful raspberry juice; shaved ice; plain water; shake.

II.—Juice of 1 lemon; 2 teaspoonfuls powdered sugar; ½ ounce raspberry syrup; shaved ice; water; shake.

Banjo Sour.—Pare a lemon, cut it in two, add a large tablespoonful of sugar, then thoroughly muddle it; add the white of an egg; an ounce of sloe gin; 3 or 4 dashes of abricotine; shake well; strain into a goblet or fizz glass, and fill balance with soda; decorate with a slice of pineapple and cherry.

Orgeat Punch.—Orgeat syrup, 12 drachms; brandy, 1 ounce; juice of 1 lemon.

Granola.—Orange syrup, 1 ounce; grape syrup, 1 ounce; juice of ½ lemon; shaved ice, q. s. Serve with straws. Dress with sliced lemon or pineapple.

American Lemonade.—One ounce orange syrup; 1 ounce lemon syrup; 1 teaspoonful powdered sugar; 1 dash acid-phosphate solution; ⅓ glass shaved ice. Fill with coarse stream. Add slice of orange, and run two straws through it.

Old-Fashioned Lemonade.—Put in a freezer and freeze almost hard, then add the fruits, and freeze very hard. Serve in a silver sherbet cup.

"Ping Pong" Frappé.—Grape juice, unfermented, 1 quart; port wine (California), ½ pint; lemon syrup, 12 ounces; pineapple syrup, 2 ounces; orange syrup, 4 ounces; Bénédictine cordial, 4 ounces; sugar, 1 pound.

Dissolve sugar in grape juice and put in wine; add the syrup and cordial; serve from a punch bowl, with ladle, into 12-ounce narrow lemonade glass and fill with solid stream; garnish with slice of orange and pineapple, and serve with straw.

Orange Frappé.—Glass half full of fine ice; tablespoonful powdered sugar; ½ ounce orange syrup; 2 dashes lemon syrup; dash prepared raspberry; ½ ounce

acid-phosphate solution. Fill with soda and stir well; strain into a mineral glass and serve.

Hot Lemonades.—

I.—Lemon essence	4	fluidrachms
Solution of citric acid	1	fluidounce
Syrup, enough to make	32	fluidounces

In serving, draw 2½ fluidounces of the syrup into an 8-ounce mug, fill with hot water, and serve with a spoon.

II.—Lemon	1	
Alcohol	1	fluidounce
Solution of citric acid	2	fluidrachms
Sugar	20	av. ounces
Water	20	fluidounces
White of	1	egg

Grate the peel of the lemon, macerate with the alcohol for a day; express; also express the lemon, mix the two, add the sugar and water, dissolve by agitation, and add the solution of citric acid and the white of egg, the latter first beaten to a froth. Serve like the preceding.

Egg Lemonade.—I.—Break 1 egg into a soda glass, add 1¼ ounces lemon syrup, a drachm of lemon juice, and a little shaved ice; then draw carbonated water to fill the glass, stirring well.

II.—Shaved ice	½	tumblerful
Powdered sugar	4	tablespoonfuls
Juice of	1	lemon
Yolk of	1	egg

Shake well, and add carbonated water to fill the glass.

HOT SODA-WATER DRINKS:

Chocolate.—I.—This may be prepared in two ways, from the powdered cocoa or from a syrup. To prepare the cocoa for use, dry mix with an equal quantity of pulverized sugar and use a heaping teaspoonful to a mug. To prepare a syrup, take 12 ounces of cocoa, 5 pints of water, and 4 pounds of sugar. Reduce the cocoa to a smooth paste with a little warm water. Put on the fire. When the water becomes hot add the paste, and then allow to boil for 3 or 4 minutes; remove from fire and add the sugar; stir carefully while heating, to prevent scorching; when cold add 3 drachms of vanilla; ½ to ¾ ounce will suffice for a cup of chocolate; top off with whipped cream.

II.—Baker's fountain chocolate	1	pound
Syrup	1	gallon
Extract vanilla		enough

Shave the chocolate into a gallon porcelained evaporating dish and melt with a gentle heat, stirring with a thin-bladed spatula. When melted remove from the fire and add 1 ounce of cold water, mixing well. Add gradually 1 gallon of hot syrup and strain; flavor to suit. Use 1 ounce to a mug.

III.—Hot Egg Chocolate.—Break a fresh egg into a soda tumbler; add 1½ ounces chocolate syrup and 1 ounce cream; shake thoroughly, add hot soda slowly into the shaker, stirring meanwhile; strain carefully into mug; top off with whipped cream and serve.

IV.—Hot Chocolate and Milk.—

Chocolate syrup	1 ounce
Hot milk	4 ounces

Stir well, fill mug with hot soda and serve.

V.—Hot Egg Chocolate.—One egg, 1¼ ounces chocolate syrup, 1 teaspoonful sweet cream; shake, strain, add 1 cup hot soda, and 1 tablespoonful whipped cream.

Coffee.—I.—Make an extract by macerating 1 pound of the best Mocha and Java with 8 ounces of water for 20 minutes, then add hot water enough to percolate 1 pint. One or 2 drachms of this extract will make a delicious cup of coffee. Serve either with or without cream, and let customer sweeten to taste.

II.—Pack ½ pound of pulverized coffee in a percolator. Percolate with 2 quarts of boiling water, letting it run through twice. Add to this 2 quarts of milk; keep hot in an urn and draw as a finished drink. Add a lump of sugar and top off with whipped cream.

III.—Coffee syrup may be made by adding boiling water from the apparatus to 1 pound of coffee, placed in a suitable filter or coffeepot, until 2 quarts of the infusion are obtained. Add to this 3 pounds of sugar. In dispensing, first put sufficient cream in the cup, add the coffee, then sweeten, if necessary, and mix with the stream from the draught tube.

IV.—Mocha coffee (ground fine)	4	ounces
Java coffee (ground fine)	4	ounces
Granulated sugar	6	pounds
Hot water	q. s.	

Percolate the coffee with hot water until the percolate measures 72 ounces. Dissolve the sugar in the percolate by agitation without heat and strain.

Hot Egg Orangeade.—One egg; juice

of ½ orange; 2 teaspoonfuls powdered sugar. Shake, strain, add 1 cup of hot water. Stir, serve with nutmeg.

Hot Egg Bouillon. — One-half ounce liquid extract beef; 1 egg; salt and pepper; hot water to fill 8-ounce mug. Stir extract, egg, and seasoning together; add water, still stirring; strain and serve.

Hot Celery Punch. — One-quarter ounce of clam juice; ¼ ounce beef extract; 1 ounce of cream; 4 dashes of celery essence. Stir while adding hot water, and serve with spices.

Chicken Bouillon.—Two ounces concentrated chicken; ½ ounce sweet cream and spice. Stir while adding hot water.

Ginger.—

Fluid extract of ginger	2½ ounces
Sugar	40 ounces
Water, to	2½ pints

Take 10 ounces of the sugar and mix with the fluid extract of ginger; heat on the water bath until the alcohol is evaporated. Then mix with 20 ounces of water and shake till dissolved. Filter and add the balance of the water and the sugar. Dissolve by agitation.

Cocoa Syrup.—

I.—Cocoa, light, soluble	4	ounces
Granulated sugar	2	pounds
Boiling hot water	1	quart
Extract vanilla	1	ounce

Dissolve the cocoa in the hot water, by stirring, then add the sugar and dissolve. Strain, and when cold add the vanilla extract.

II.—Cocoa syrup	2	ounces
Cream	1	ounce

Turn on the hot water stream and stir while filling. Top off with whipped cream.

Hot Soda Toddy.—

Lemon juice	2 fluidrachms
Lemon syrup	1 fluidounce
Aromatic bitters	1 fluidrachm
Hot water, enough to fill an 8-ounce mug.	

Sprinkle with nutmeg or cinnamon.

Hot Orange Phosphate.—

Orange syrup	1 fluidounce
Solution of acid phosphate	1 fluidrachm
Hot water, enough to fill an 8-ounce mug.	

It is prepared more acceptably by mixing the juice of half an orange with acid phosphate, sugar, and hot water.

Pepsin Phosphate.—One teaspoonful of liquid pepsin; 2 dashes of acid phosphate; 1 ounce of lemon syrup; 1 cup hot water.

Cream Beef Tea.—Use 1 teaspoonful of liquid beef extract in a mug of hot water, season with salt and pepper, then stir in a tablespoonful of rich cream. Put a teaspoonful of whipped cream on top and serve with flakes.

Cherry Phosphate.—Cherry-phosphate syrup, 1½ ounces; hot water to make 8 ounces.

Cherry-phosphate syrup is made as follows: Cherry juice, 3 pints; sugar, 6 pounds; water, 1 pint; acid phosphate, 4 ounces. Bring to a boil, and when cool add the acid phosphate.

Celery Clam Punch.—Clam juice, 2 drachms; beef extract, 1 drachm; cream, 1 ounce; essence of celery, 5 drops; hot water to make 8 ounces.

Claret Punch.—Claret wine, 2 ounces; sugar, 3 teaspoonfuls; juice of ½ lemon; hot water to make 8 ounces.

Ginger.—Extract of ginger, 2 drachms; sugar, 2 drachms; lemon juice, 2 dashes; hot water to make 8 ounces.

Lemon Juice, Plain.—Fresh lemon juice, 2½ drachms; lemon syrup, 1 ounce; hot water, q. s. to make 8 ounces.

Lime Juice.—Lime juice, ¾ drachm; lemon syrup, 1 ounce; hot water to make 8 ounces. Mix. Eberle remarks that lemon juice or lime juice enters into many combinations. In plain soda it may be combined with ginger and other flavors, as, for instance, chocolate and coffee.

Lemonade.—Juice of 1 lemon; powdered sugar, 2 teaspoonfuls; hot water to make 8 ounces. A small piece of fresh lemon peel twisted over the cup lends an added flavor.

Hot Malt.—Extract of malt, 1 ounce; cherry syrup, 1 ounce; hot water, sufficient to make 8 ounces. Mix.

Malted Milk.—Horlick's malted milk, 2 tablespoonfuls; hot water, quantity sufficient to make 8 ounces; flavoring to suit. Mix. Essence of coffee, chocolate, etc., and many of the fruit syrups go well with malted milk.

Hot Malted Milk Coffee (or Chocolate).—Malted milk, 2 teaspoonfuls; coffee (or chocolate) syrup, 1 ounce; hot water, quantity sufficient to make 8 ounces.

Hot Beef Tea.—I.—Best beef extract, 1 tablespoonful; sweet cream, 1 ounce; hot

water, 7 ounces; pepper, salt, etc., quantity sufficient. Mix.

II.—Extract beef bouillon, 1 teaspoonful; extract aromatic soup herbs (see Condiments), 10 drops; hot soda, 1 cupful. Mix.

III.—Extract of beef..... 1 teaspoonful
Hot water..... q. s.
Pepper, salt, and celery salt.
Mix.

Hot Bouillon.—

Beef extract..... 1 ounce
Hot water, q. s. to make..... 8 ounces
Pepper, salt, etc..... q. s.
Mix.

Clam Bouillon.—

I.—Clam juice..... 12 drachms
Cream..... 2 ounces
Hot water, q. s. to make 8 ounces
Mix.

II.—Extract clam bouillon 2 ounces
Prepared milk..... 2 drachms
Extract of aromatic soup herbs..... 5 drops
Extract white pepper.. 5 drops
Hot soda..... 1 cupful
Mix.

III.—Clam juice may be served with hot water, salt and pepper added. Adding butter makes this bouillon a broth.

It may also be served with milk or cream, lemon juice, tomato catsup, etc. Hot oyster juice may be served in the same way.

Hot Tea.—

I.—Tea syrup..... sufficient
Hot water, q. s. to make..... 1 cupful

II.—Loaf sugar..... 4 cubes
Extract of Oolong tea, about..... 1 dessertsp'ful
Prepared milk, about 1 dessertsp'ful
Hot soda..... 1 cupful
Whipped cream... 1 tablespoonful

Mix the tea extract, sugar, and prepared milk, pour on water, and dissolve. Top off with whipped cream.

Hot Egg Drinks.—I.—One-half to 1 ounce liquid extract of beef, 1 egg, salt and pepper to season, hot water to fill an 8-ounce mug. Stir the extract, egg, and seasoning together with a spoon, to get well mixed, add the water, stirring briskly meanwhile; then strain, and serve. Or shake the egg and extract in a shaker, add the water, and mix by pouring back and forth several times, from shaker to mug.

II.—Hot Egg Chocolate.—One to 1½ ounces chocolate syrup, 1 egg, ½ ounce cream, hot water sufficient to fill an 8-ounce mug.

Mix the syrup, egg, and cream together in an egg-shaker; shake as in making cold drinks; add the hot water, and mix all by pouring back and forth several times, from shaker to mug. Or, prepare by beating the egg with a spoon, add the syrup and cream, mix all quickly with the spoon, and add hot water, stirring constantly, and strain.

III.—Hot Egg Coffee.—One egg, 1 dessertspoonful extract of coffee, 1 teaspoonful sweet cream, 1 ounce syrup. Shake well, strain, and add 1 cupful hot water and top with whipped cream.

IV.—Hot Egg Lemonade.—One egg, juice of 1 lemon, 3 teaspoonfuls powdered sugar. Beat the egg with lemon juice and sugar thoroughly. Mix while adding the water. Serve grated nutmeg and cinnamon. The amount of lemon juice and sugar may be varied to suit different tastes.

V.—Hot Egg Milk.—Two teaspoonfuls sugar, 1 ounce cream, 1 egg, hot milk to fill an 8-ounce mug. Prepare as in hot egg chocolate, top with whipped cream, and sprinkle with nutmeg. If there are no facilities for keeping hot milk, use about 2 ounces of cream, and fill mug with hot water.

VI.—Hot Egg Nogg.—Plain syrup, ¾ ounce; brandy, ½ ounce; Angostura bitters, 3 drops; 1 egg. Put in shaker and beat well. Strain in 10-ounce mug, and fill with hot milk; finish with whipped cream and nutmeg.

VII.—Hot Egg Phosphate.—Two ounces lemon syrup, 1 egg, ½ ounce solution of acid phosphate. Mix in a glass, and shake together thoroughly; pour into another glass, heated previously, and slowly draw full of hot water; season with nutmeg.

VIII.—Hot Egg Phosphate.—Break fresh egg into shaker and add ½ ounce pineapple syrup, ½ ounce orange syrup, 1 dash phosphate. Shake, without ice, and pour into bouillon cup. Draw cupful of hot water, sprinkle a touch of cinnamon, and serve with wafers.

FANCY SODA DRINKS:

Coffee Cream Soda.—Serve in a 12-ounce glass. Draw 1½ ounces of syrup and 1 ounce of cream. Into the shaker draw 8 ounces of carbonated water, pour into the glass sufficient to fill it to within

1 inch of the top; pour from glass to shaker and back, once or twice, to mix thoroughly; give the drink a rich, creamy appearance, and make it cream sufficiently to fill the glass.

Iced Coffee.—Serve in a 10-ounce glass. Draw 1 ounce into glass, fill nearly full with ice-cold milk, and mix by stirring.

Egg Malted Milk Coffee.—Prepare same as malted milk coffee, with the exception of adding the egg before shaking, and top off with a little nutmeg, if desired. This drink is sometimes called coffee light lunch.

Coffee Frappé.—Serve in a 12-ounce glass. Coffee syrup, 1½ ounces; white of 1 egg; 1 to 1½ ounces of pure, rich, sweet cream; a small portion of fine shaved ice; shake thoroughly to beat the white of the egg light, and then remove the glass, leaving the contents in the shaker. Now fill the shaker two-thirds full, using the fine stream only. Draw as quickly as possible that the drink may be nice and light. Now pour into glass and back, and then strain into a clean glass. Serve at once, and without straws. This should be drunk at once, else it will settle, and lose its lightness and richness.

Coffee Nogg.—

Coffee syrup	2 ounces
Brandy	4 drachms
Cream	2 ounces
One egg.	

Coffee Cocktail.—

Coffee syrup	1 ounce
One egg.	
Port wine	1 ounce
Brandy	2 drachms

Shake, strain into a small glass, and add soda. Mace on top.

Chocolate and Milk.—

Chocolate syrup	2 ounces
Sweet milk, sufficient.	

Fill a glass half full of shaved ice, put in the syrup, and add milk until the glass is almost full. Shake well, and serve without straining. Put whipped cream on top and serve with straws.

Chocolate Frappé.—

Frozen whipped cream, sufficient.
Shaved ice, sufficient.

Fill a glass half full of frozen whipped cream, fill with shaved ice nearly to the top, and pour in chocolate syrup. Other syrups may be used, if desired.

Royal Frappé.—This drink consists of 3 parts black coffee and 1 part of brandy, frozen in a cooler, and served while in a semifrozen state.

Mint Julep.—One-half tumbler shaved ice, teaspoonful powdered sugar, dash lemon juice, 2 or 3 sprigs of fresh mint. Crush the mint against side of the glass to get the flavor. Then add claret syrup, ½ ounce; raspberry syrup, 1½ ounces; and draw carbonated water nearly to fill glass. Insert bunch of mint and fill glass, leaving full of shaved ice. Serve with straws, and decorate with fruits of the season.

Grape Glacé.—Beat thoroughly the whites of 4 eggs and stir in 1 pound of powdered sugar, then add 1 pint grape juice, 1 pint water, and 1 pound more of powdered sugar. Stir well until sugar is dissolved, and serve from a pitcher or glass dish, with ladle.

"Golf Goblet."—Serve in a 12-ounce glass; fill two-thirds full of cracked ice, add ½ ounce pineapple juice, 1 teaspoonful lemon juice, 1 teaspoonful raspberry vinegar. Put spoon in glass, and fill to within one-half inch of top with carbonated water; add shaved ice, heaping full. Put strawberry or cherry on top, and stick slice of orange down side of glass. Serve with spoon and straws.

Goldenade.—Shaved ice, ½ tumblerful; powdered sugar; juice of 1 lemon; yolk of 1 egg. Shake well, add soda water from large stream, turn from tumbler to shaker, and vice versa, several times, and strain through julep strainer into a 12-ounce tumbler.

Lunar Blend.—Take two mixing glasses, break an egg, putting the yolk in one glass, the white into the other; into the glass with the yolk add 1 ounce cherry syrup and some cracked ice; shake, add small quantity soda, and strain into a 12-ounce glass. Into the other mixing glass add 1 ounce plain sweet cream, and beat with bar spoons until well whipped; add ½ ounce lemon syrup, then transfer it into the shaker, and add soda from fine stream only, and float on top of the one containing the yolk and sherry. Serve with two straws.

Egg Chocolate.—

Chocolate syrup	2 ounces
Cream	4 ounces
White of one egg.	

Egg Crême de Menthe.—
Mint syrup..... 12 drachms
Cream ..... 3 ounces
White of one egg.
Whisky..... 4 drachms

Egg Sherbet.—
Sherry syrup..... 4 drachms
Pineapple syrup..... 4 drachms
Raspberry syrup..... 4 drachms
One egg.
Cream.

Egg Claret.—
Claret syrup..... 2 ounces
Cream..... 3 ounces
One egg.

Royal Mist.—
Orange syrup..... 1 ounce
Catawba syrup..... 1 ounce
Cream ..... 2 ounces
One egg.

Banana Cream.—
Banana syrup..... 12 drachms
Cream ..... 4 ounces
One egg.

Egg Coffee.—
Coffee syrup..... 2 ounces
Cream ..... 3 ounces
One egg.
Shaved ice.

Cocoa Mint.—
Chocolate syrup..... 1 ounce
Peppermint syrup.... 1 ounce
White of one egg.
Cream ..... 2 ounces

The peppermint syrup is made as follows:

Oil of peppermint... 30 minims
Syrup simplex..... 1 gallon
Soda foam..... 1 ounce

Egg Lemonade.—
Juice of one lemon.
Pulverized sugar..... 3 teasp'fuls
One egg.
Water, q. s.

Shake well, using plenty of ice, and serve in a small glass.

Nadjy.—
Raspberry juice.....1 ounce
Pineapple syrup..... 1 ounce
One egg.
Cream ..... 2 ounces

Siberian Flip.—
Orange syrup..... 1 ounce
Pineapple syrup..... 1 ounce
One egg.
Cream ..... 2 ounces

Egg Orgeat.—
Orgeat syrup.....12 drachms
Cream ..... 3 ounces
One egg.

Normona.—
Peach syrup..... 1 ounce
Grape syrup..... 1 ounce
Cream ..... 3 ounces
Brandy ..... 2 drachms
One egg.

Silver Fizz.—
Catawba syrup..... 2 ounces
Holland gin..... 2 drachms
Lemon juice..... 8 dashes
White of one egg.

Golden Fizz.—
Claret syrup..... 2 ounces
Holland gin..... ¼ ounce
Lemon juice..... 8 dashes
Yolk of one egg.

Rose Cream.—
Rose syrup.....12 drachms
Cream ..... 4 ounces
White of one egg.

Violet Cream.—
Violet syrup..... 12 drachms
Cream ..... 4 ounces
White of one egg.

Rose Mint.—
Rose syrup..... 6 drachms
Mint syrup..... 6 drachms
Cream ..... 3 ounces
White of one egg.

Currant Cream.—
Red-currant syrup... 2 ounces
Cream ..... 3 ounces
One egg.

Quince Flip.—
Quince syrup..... 2 ounces
Cream ..... 3 ounces
One egg.
Shaved ice.

Coffee Nogg.—
Coffee syrup..... 2 ounces
Brandy ..... 4 drachms
Cream ..... 2 ounces
One egg.

Egg Sour.—
Juice of one lemon.
Simple syrup.....12 drachms
One egg.

Shake, strain, and fill with soda. Mace on top.

Lemon Sour.—

Lemon syrup	12 drachms
Juice of one lemon.	
One egg.	

Raspberry Sour.—

Raspberry syrup	12 drachms
One egg.	
Juice of one lemon.	

Yama.—

One egg.	
Cream	2 ounces
Sugar	2 teaspoonfuls
Jamaica rum	½ ounce

Shake well, put into cup, and add hot water. Serve with whipped cream, and sprinkle mace on top.

Prairie Oyster.—

Cider vinegar	2 ounces
One egg.	

Put vinegar into glass, and break into it the egg. Season with salt and pepper. Serve without mixing.

Fruit Frappé.—

Granulated gelatin	1 ounce
Juice of six lemons.	
Beaten whites of two eggs.	
Water	5 quarts
Syrup	1 quart
Maraschino cherries	8 ounces
Sliced peach	4 ounces
Sliced pineapple	4 ounces
Whole strawberries	4 ounces
Sliced orange	4 ounces

Dissolve the gelatin in 1 quart boiling hot water; add the syrup and the balance of the water; add the whites of the eggs and lemon juice.

KOUMISS.

The original koumiss is the Russian, made from mare's milk, while that produced in this country and other parts of Europe is usually, probably always, made from cow's milk. For this reason there is a difference in the preparation which may or may not be of consequence. It has been asserted that the ferment used in Russia differs from ordinary yeast, but this has not been established.

In an article on this subject, contributed by D. H. Davies to the *Pharmaceutical Journal and Transactions*, it is pointed out that mare's milk contains less casein and fatty matter than cow's milk, and he states that it is "therefore far more easy of digestion." He thinks that cow's milk yields a better preparation when diluted with water to reduce the percentage of casein, etc. He proposes the following formula:

Fresh milk	12 ounces
Water	4 ounces
Brown sugar	150 grains
Compressed yeast	24 grains
Milk sugar	3 drachms

Dissolve the milk sugar in the water, add to the milk, rub the yeast and brown sugar down in a mortar with a little of the mixture, then strain into the other portion.

Strong bottles are very essential, champagne bottles being frequently used, and the corks should fit tightly; in fact, it is almost necessary to use a bottling machine for the purpose, and once the cork is properly fixed it should be wired down. Many failures have resulted because the corks did not fit properly, the result being that the carbon dioxide escaped as formed and left a worthless preparation. It is further necessary to keep the preparation at a moderate temperature, and to be sure that the article is properly finished the operator should gently shake the bottles each day for about 10 minutes to prevent the clotting of the casein. It is well to take the precaution of rolling a cloth around the bottle during the shaking process, as the amount of gas generated is great, and should the bottle be weak it might explode.

Kogelman says that if 1 volume of buttermilk be mixed with 1 or 2 volumes of sweet milk, in a short time lively fermentation sets in, and in about 3 days the work is completed. This, according to the author, produces a wine-scented fluid, rich in alcohol, carbon dioxide, lactic acid, and casein, which, according to all investigations yet made, is identical with koumiss. The following practical hints are given for the production of a good article: The sweet milk used should not be entirely freed from cream; the bottles should be of strong glass; the fermenting milk must be industriously shaken by the operator at least 3 times a day, and then the cork put in firmly, so that the fluid will become well charged with carbon-dioxide gas; the bottles must be daily opened and at least twice each day brought nearly to a horizontal position, in order to allow the carbon dioxide to escape and air to enter; otherwise fermentation rapidly ceases. If a drink is desired strong in carbonic acid, the bottles, toward the end of fermentation, should be placed with the necks down. In order to ferment a fresh quantity of milk, simply add ¼ of its volume of either actively fermenting or freshly fermented milk. The temperature should be from 50° to 60° F., about 60° being the most favorable.

Here are some miscellaneous formulas:

I.—Fill a quart champagne bottle up to the neck with pure milk; add 2 tablespoonfuls of white sugar, after dissolving the same in a little water over a hot fire; add also a quarter of a 2-cent cake of compressed yeast. Then tie the cork in the bottle securely, and shake the mixture well; place it in a room of the temperature of 50° to 95° F. for 6 hours, and finally in the ice box over night. Handle wrapped in a towel as protection if the bottle should burst. Be sure that the milk is pure, that the bottle is sound, that the yeast is fresh, to open the mixture in the morning with great care, on account of its effervescent properties; and be sure not to drink it at all if there is any curdle or thickening part resembling cheese, as this indicates that the fermentation has been prolonged beyond the proper time.

II.—Dilute the milk with ⅛ part of hot water, and while still tepid add ⅛ of very sour (but otherwise good) buttermilk. Put it into a wide jug, cover with a clean cloth, and let stand in a warmish place (about 75° F.) for 24 hours; stir up well, and leave for another 24 hours. Then beat thoroughly together, and pour from jug to jug till perfectly smooth and creamy. It is now "still" koumiss, and may be drunk at once. To make it sparkling, which is generally preferred, put it into champagne or soda-water bottles; do not quite fill them, secure the corks well, and lay them in a cool cellar. It will then keep for 6 or 8 weeks, though it becomes increasingly acid. To mature some for drinking quickly, it is as well to keep a bottle or two to start with in some warmer place, and from time to time shake vigorously. With this treatment it should, in about 3 days, become sufficiently effervescent to spurt freely through a champagne tap, which must be used for drawing it off as required. Later on, when very frothy and acid it is more pleasant to drink if a little sweetened water (or milk and water) is first put into the glass. Shake the bottle, and hold it inverted well into the tumbler before turning the tap. Having made one lot of koumiss as above you can use some of that instead of buttermilk as a ferment for a second lot, and so on 5 or 6 times in succession; after which it will be found advisable to begin again as at first. Mare's milk is the best for koumiss; then ass's milk. Cow's milk may be made more like them by adding a little sugar of milk (or even loaf sugar) with the hot water before fermenting. But perhaps the chief drawback to cow's milk is that the cream separates permanently, whereas that of mare's milk will remix. Hence use partially skimmed milk; for if there is much cream it only forms little lumps of butter, which are apt to clog the tap, or are left behind in the bottle.

Kwass.—Kwass is a popular drink among the Russian population of Kunzews, prepared as follows: In a big kettle put from 13 to 15 quarts of water, and bring to a boil, and when in active ebullition pour in 500 grams of malt. Let boil for 20 minutes, remove from the fire, let cool down, and strain off. The liquid is now put into a clean keg or barrel, 30 grams (about an ounce) of best compressed yeast added along with about 600 grams (20 ounces) of sugar, and the cask is put in a warm place to ferment. As soon as bubbles of carbonic gas are detected on the surface of the liquid, it is a signal that the latter is ready for bottling. In each of the bottles, which should be strong and clean, put one big raisin, fill, cork, and wire down. The bottles should be placed on the side, and in the coolest place available—best, on ice. The liquor is ready for drinking in from 2 to 3 days, and is said to be most palatable.

"Braga."—Braga is a liquid of milky turbidity, resembling *café au lait* in color, and forming a considerable precipitate if left alone. When shaken it sparkles and a little gas escapes. Its taste is more or less acid, possessing a pleasant flavor.

About 35 parts of crushed millet, to which a little wheat flour is added, are placed in a large kettle. On this about 400 parts of water are poured. The mixture is stirred well and boiled for 3 hours. After settling for 1 hour the lost water is renewed and the boiling continued for another 10 hours. A viscous mass remains in the kettle, which substance is spread upon large tables to cool. After it is perfectly cool, it is stirred with water in a wooden trough and left to ferment for 8 hours. This pulp is sifted, mixed with a little water, and after an hour the braga is ready for sale. The taste is a little sweetish at first, but becomes more and more sourish in time. Fermentation begins only in the trough.

WINTER BEVERAGES:

Campchello.—Thoroughly beat the yolks of 12 fresh eggs with 2¼ pounds finely powdered, refined sugar, the juice

of 3 lemons and 2 oranges, and 3 bottles of Grâves or other white wine, over the fire, until rising. Remove, and slowly beat 1 bottle of Jamaica rum with it.

Egg Wine.—Vigorously beat 4 whole eggs and the yolks of 4 with ½ pound of fine sugar; next add 2 quarts of white wine and beat over a moderate fire until rising.

Bavaroise au Cognac.—Beat up the yolks of 8 eggs in 1 quart of good milk over the fire, until boiling, then quickly add 5 ounces of sugar and ½ quart of fine cognac.

Bavaroise au Café.—Heat 1 pint of strong coffee and 1 pint of milk, 5 ounces of sugar, and the yolks of 8 eggs, until boiling, then add ⅛ quart of Jamaica rum.

Carbonated Pineapple Champagne.—

Plain syrup, 42°.....	10	gallons
Essence of pineapple	8	drachms
Tincture of lemon...	5	ounces
Carbonate of magnesia.....	1	ounce
Liquid saffron.....	2½	ounces
Citric-acid solution..	30	ounces
Caramel.....	2½	ounces

Filter before adding the citric-acid solution and limejuice. Use 2 ounces to each bottle.

A German Drink.—To 100 parts of water add from 10 to 15 parts of sugar, dissolve and add to the syrup thus formed an aqueous extract of 0.8 parts of green or black tea. Add fresh beer or brewers' yeast, put in a warm place and let ferment. When fermentation has progressed to a certain point the liquid is cleared, and then bottled, corked, and the corks tied down. The drink is said to be very pleasant.

Limejuice Cordial.—Limejuice cordial that will keep good for any length of time may be made as follows: Sugar, 6 pounds; water, 4 pints; citric acid, 4 ounces; boric acid, ½ ounce. Dissolve by the aid of a gentle heat, and when cold add refined limejuice, 60 ounces; tincture of lemon peel, 4 ounces; water to make up to 2 gallons, and color with caramel.

Summer Drink.—

Chopped ice.....	2	tablespoonfuls
Chocolate syrup..	2	tablespoonfuls
Whipped cream...	3	tablespoonfuls
Milk.....	½	cup
Carbonated water.	½	cup

Shake or stir well before drinking. A tablespoonful of vanilla ice cream is a desirable addition. A plainer drink is made by combining the syrup, ¾ cup of milk, and the ice, and shaking well.

American Champagne.—Good cider (crab-apple cider is the best), 7 gallons; best fourth-proof brandy, 1 quart; genuine champagne wine, 5 pints; milk, 1 gallon; bitartrate of potassa, 2 ounces. Mix, let stand a short time; bottle while fermenting. An excellent imitation.

British Champagne.—Loaf sugar, 56 pounds; brown sugar (pale), 48 pounds; water (warm), 45 gallons; white tartar, 4 ounces; mix, and at a proper temperature add yeast, 1 quart; and afterwards sweet cider, 5 gallons; bruised wild cherries, 14 or 15 ounces; pale spirits, 1 gallon; orris powder, ½ ounce. Bottle while fermenting.

Champagne Cider.—Good pale cider, 1 hogshead; spirits, 3 gallons; sugar, 20 pounds; mix, and let it stand one fortnight; then fine with skimmed milk, ½ gallon; this will be very pale, and a similar article, when properly bottled and labeled, opens so briskly that even good judges have mistaken it for genuine champagne.

BEER:

Scotch Beer.—Add 1 peck malt to 4 gallons of boiling water and let it mash for 8 hours, and then strain, and in the strained liquor boil:

Hops.....	4 ounces
Coriander seeds.....	1 ounce
Honey.....	1 pound
Orange peel.....	2 ounces
Bruised ginger.....	1 ounce

Boil for half an hour, then strain and ferment in the usual way.

Hop Bitter Beer.—

Coriander seeds.....	2 ounces
Orange peel.....	4 ounces
Ginger.....	1 ounce
Gentian root.....	½ ounce

Boil in 5 gallons of water for half an hour, then strain and put into the liquor 4 ounces hops and 3 pounds of sugar, and simmer for 15 minutes, then add sufficient yeast, and bottle when ready.

Sarsaparilla Beer.—I.—Compound extract of sarsaparilla, 1½ ounces; hot water, 1 pint; dissolve, and when cold, add of good pale or East India ale, 7 pints.

II.—Sarsaparilla (sliced), 1 pound; guaiacum bark (bruised small), ¼ pound; guaiacum wood (rasped) and licorice root (sliced), of each, 2 ounces; aniseed (bruised), 1½ ounces; mezereon root-

bark, 1 ounce; cloves (cut small), ¼ ounce; moist sugar, 3½ pounds; hot water (not boiling), 9 quarts; mix in a clean stone jar, and keep it in a moderately warm room (shaking it twice or thrice daily) until active fermentation sets in, then let it repose for about a week, when it will be ready for use. This is said to be superior to the other preparations of sarsaparilla as an alterative or purifier of the blood, particularly in old affections. That usually made has generally only ½ of the above quantity of sugar, for which molasses is often substituted; but in either case it will not keep well; whereas, with proper caution, the products of the above formulas may be kept for 1 or even 2 years. No yeast must be used. Dose: A small tumblerful 3 or 4 times a day, or oftener.

Spruce Beer.—I.—Sugar, 1 pound; essence of spruce, ½ ounce; boiling water, 1 gallon; mix well, and when nearly cold add of yeast ½ wineglassful; and the next day bottle like ginger beer.

II.—Essence of spruce, ½ pint; pimento and ginger (bruised), of each, 5 ounces; hops, ½ pound; water, 3 gallons; boil the whole for 10 minutes, then add of moist sugar, 12 pounds (or good molasses, 14 pounds); warm water, 11 gallons; mix well, and, when only lukewarm, further add of yeast, 1 pint; after the liquid has fermented for about 24 hours, bottle it.

This is diuretic and antiscorbutic. It is regarded as an agreeable summer drink, and often found useful during long sea voyages. When made with lump sugar it is called White Spruce Beer; when with moist sugar or treacle, Brown Spruce Beer. An inferior sort is made by using less sugar or more water.

Treacle Beer.—I.—From treacle or molasses, ¾ to 2 pounds per gallon (according to the desired strength); hops, ¼ to ¾ ounce; yeast, a tablespoonful; water, q. s.; treated as below.

II.—Hops, 1½ pounds; corianders, 1 ounce; capsicum pods (cut small), ½ ounce; water, 8 gallons; boil for 10 or 15 minutes, and strain the liquor through a coarse sieve into a barrel containing treacle, 28 pounds; then throw back the hops, etc., into the copper and reboil them, for 10 minutes, with a second 8 gallons of water, which must be strained into the barrel, as before; next "rummage" the whole well with a stout stick, add of cold water 21 gallons (sufficient to make the whole measure 37 gallons), and, again after mixing, stir in ½ pint of good fresh yeast; lastly, let it remain for 24 hours in a moderately warm place, after which it may be put into the cellar, and in 2 or 3 days bottled or tapped on draught. In a week it will be fit to drink. For a stronger beer, 36 pounds, or even half a hundredweight of molasses may be used. It will then keep good for a twelvemonth. This is a wholesome drink, but apt to prove laxative when taken in large quantities.

Weiss Beer.—This differs from the ordinary lager beer in that it contains wheat malt. The proportions are ⅔ wheat to ⅓ barley malt, 1 pound hops being used with a peck of the combined malt to each 20 gallons of water. A good deal depends on the yeast, which must be of a special kind, the best grades being imported from Germany.

Yellow Coloring for Beverages.—The coloring agents employed are fustic, saffron, turmeric, quercitron, and the various aniline dyes. Here are some formulas:

I.—Saffron	1	ounce
Deodorized alcohol	4	fluidounces
Distilled water	4	fluidounces

Mix alcohol and water, and then add the saffron. Allow the mixture to stand in a warm place for several days, shaking occasionally; then filter. The tincture thus prepared has a deep orange color, and when diluted or used in small quantities gives a beautiful yellow tint to syrups, etc.

II.—Ground fustic wood	1½	ounces
Deodorized alcohol	4	fluidounces
Distilled water	4	fluidounces

This color may be made in the same manner as the liquid saffron, and is a fine coloring for many purposes.

III.—Turmeric powder	2	ounces
Alcohol, dilute	16	ounces

Macerate for several days, agitating frequently, and filter. For some beverages the addition of this tincture is not to be recommended, as it possesses a very spicy taste.

The nonpoisonous aniline dyes recommended for coloring confectionery, beverages, liquors, essences, etc., yellow are those known as acid yellow R and tropæolin 000 (orange I).

BICYCLE-TIRE CEMENT:
See Adhesives, under Rubber Cements.

BICYCLE VARNISHES:
See Varnishes.

BIDERY METAL:
See Alloys.

BILLIARD BALLS:
See Ivory and Casein.

BIRCH BALSAM:
See Balsam.

BIRCH WATER:
See Hair Preparations.

BIRD DISEASES AND THEIR REMEDIES:
See Veterinary Formulas.

BIRD FOODS:
See also Veterinary Formulas.

Mixed Birdseed.—

Canary seed	6 parts
Rape seed	2 parts
Maw seed	1 part
Millet seed	2 parts

Mocking-Bird Food.—

Cayenne pepper	2 ounces
Rape seed	8 ounces
Hemp seed	16 ounces
Corn meal	2 ounces
Rice	2 ounces
Cracker	8 ounces
Lard oil	2 ounces

Mix the solids, grinding to a coarse powder, and incorporate the oil.

Food for Redbirds.—

Sunflower seed	8 ounces
Hemp seed	16 ounces
Canary seed	10 ounces
Wheat	8 ounces
Rice	6 ounces

Mix and grind to coarse powder.

BIRD LIME:
See Lime.

BIRD PASTE:
See Canary-Bird Paste.

BISCHOFF:
See Wines and Liquors.

BISCUIT, DOG:
See Dog Biscuit.

BISMUTH ALLOYS:
See Alloys.

BISMUTH, PURIFICATION OF:
See Gold.

BITTERS:
See Wines and Liquors.

BITTER WATER:
See Waters.

BLACKING FOR HARNESS:
See Leather.

BLACKING FOR SHOES:
See Shoedressings.

BLACKING, STOVE:
See Stove Blackings and Polishes.

BLACKBERRY CORDIAL AND BLACKBERRY MIXTURE AS A CHOLERA REMEDY:
See Cholera Remedy.

BLACKBOARD PAINT AND VARNISH:
See Paint and Varnish.

BLACKHEAD REMEDIES:
See Cosmetics.

BLANKET WASHING:
See Household Formulas.

BLASTING POWDER:
See Explosives.

Bleaching

Linen.—Mix common bleaching powder in the proportion of 1 pound to a gallon of water; stir it occasionally for 3 days, let it settle, and pour it off clear. Then make a lye of 1 pound of soda to 1 gallon of boiling water, in which soak the linen for 12 hours, and boil it half an hour; next soak it in the bleaching liquor, made as above; and lastly, wash it in the usual manner. Discolored linen or muslin may be restored by putting a portion of bleaching liquor into the tub wherein the articles are soaking.

Straw.—I.—Dip the straw in a solution of oxygenated muriatic acid, saturated with potash. (Oxygenated muriate of lime is much cheaper.) The straw is thus rendered very white, and its flexibility is increased.

II.—Straw is bleached by simply exposing it in a closed chamber to the fumes of burning sulphur. An old flour barrel is the apparatus most used for the purpose by milliners, a flat stone being laid on the ground, the sulphur ignited thereon, and the barrel containing the goods to be bleached turned over it. The goods should be previously washed in pure water.

Wool, Silk, or Straw.—Mix together 4 pounds of oxalic acid, 4 pounds of table salt, water 50 gallons. The goods are laid in this mixture for 1 hour; they are then generally well bleached, and only require to be thoroughly rinsed and worked. For bleaching straw it is best to soak the goods in caustic soda, and afterwards to make use of chloride of lime or Javelle water. The excess of

chlorine is afterwards removed by hyposulphite of soda.

Feathers.—Place the feathers from 3 to 4 hours in a tepid dilute solution of bichromate of potassa, to which, cautiously, some nitric acid has been added (a small quantity only). To remove a greenish hue induced by this solution, place them in a dilute solution of sulphuric acid, in water, whereby the feathers become perfectly white and bleached.

Bleaching Solution.—Aluminum hypochloride, or Wilson's bleaching liquid, is produced by adding to a clear solution of lime chloride a solution of aluminum sulphate (alumina, alum) as long as a precipitate keeps forming. By mutual decomposition aluminum chloride results, which remains in solution, and lime sulphate (gypsum), which separates out in the form of an insoluble salt.

BLIGHT REMEDIES.

I.—Soft soap	40 parts
Amyl alcohol	50 parts
Methylated spirit	20 parts
Water	1,000 parts
II.—Soft soap	30 parts
Sulphureted potash	2 parts
Amyl alcohol	32 parts
Water	1,000 parts
III.—Soft soap	15 parts
Sulphureted potash	29 parts
Water	1,000 parts

BLEACHING WATER:

The most efficient bleaching water and also the cheapest to prepare, provided you have the facilities, is sodium hypochlorite. A solution of sodium chloride is subjected to electrolysis. For this purpose a source of cheap electric current, such as that provided by abundant water power, is necessary. The current is allowed to flow until all the salt is converted into caustic soda at the cathode and chlorine at the anode. The mixture of these two substances forms sodium hypochlorite which is bottled as is.

Two other waters are as follows:

1. Sodium carbonate—10 pounds. Dissolve in two gallons of water. Add two pounds chloride of lime. Let stand one day and then filter.

2. Dissolve two pounds of chloride of lime in one gallon of water. Dissolve two pounds of alum in one gallon of water. Mix together. Let stand one day and filter.

BLUE FROM GREEN AT NIGHT, TO DISTINGUISH:

To distinguish blue from green at night, use either the light of a magnesium wire for this purpose or take a number of Swedish (parlor) matches, light them, and as soon as they flash up, observe the 2 colors, when the difference can be easily told.

BLEACHING BLUE PRINTS:

A four per cent solution of soda and water will lighten over-exposed blueprints or will bleach them nearly white if desired; add more soda to bleach completely.

BLUE PRINTS, TO MAKE CHANGES AND CORRECTIONS ON:

Use a solution of sodium carbonate and water, with a little red ink mixed in. This gives a very pleasing pink color to the changes which, at the same time, is very noticeable. The amount of sodium carbonate used depends upon the surface of the blue-print paper, as some coarse-grained papers will look better if less soda is used and *vice versa*. However, the amount of powdered soda held on a small coin dissolved in a bottle of water gives good results.

BLUE PRINT MARKING FLUID:

1 ounce potassium oxalate
1 ounce gum arabic
1 dram (60 grains) water
6 ounces cobalt-blue to color

BOIL REMEDY.

Take a piece of soft linen or borated gauze, rub some vaseline upon one side of it, quickly pour upon it some chloroform, apply it to the unopened boil or carbuncle, and place a bandage over all. It smarts a little at first, but this is soon succeeded by a pleasing, cool sensation. The patient is given a bottle of the remedy, and directed to change the cloth often. In from 2 hours to 1 day the boil (no matter how indurated) softens and opens.

Boiler Compounds

There are three chemicals which are known to attack boiler scale. These are caustic soda, soda ash, and tannic-acid compounds, the last being derived from sumac, catechu, and the exhausted bark liquor from tanneries.

Caustic soda in large excess is injurious to boiler fittings, gaskets, valves,

etc. That it is injurious, in reasonable excess, to the boiler tubes themselves is yet to be proved. Foaming and priming may be caused through excess of caustic soda or soda ash, as is well known by every practical engineer. Tannic acid is to be condemned and the use of its salts is not to be recommended. It may unite with the organic matter, present in the form of albuminoids, and with calcium and magnesium carbonates. That it removes scale is an assured fact; that it removes iron with the scale is also assured, as tannic acid corrodes an iron surface rapidly.

Compounds of vegetable origin are widely advertised, but they often contain dextrine and gum, both of which are dangerous, as they coat the tubes with a compact scale, not permitting the water to reach the iron. Molasses is acid and should not be used in the boiler. Starch substances generally should be avoided. Kerosene must be dangerous, as it is very volatile and must soon leave the boiler and pass over and through the engine.

There are two materials the use of which in boilers is not prohibited through action upon the metal itself or on account of price. These are soda ash and caustic soda. Sodium triphosphate and sodium fluoride have both been used with success, but their cost is several hundred per cent greater than soda ash. If prescribed as per analysis, in slight excess, there should be no injurious results through the use of caustic soda and soda ash. It would be practicable to manufacture an intimate mixture of caustic soda and carbonate of soda, containing enough of each to soften the average water of a given district.

There is a great deal of fraud in connection with boiler compounds generally. The better class of venders advertise to prepare a special compound for special water. This is expensive, save on a large scale, in reference to a particular water, for it would mean a score or more of tanks with men to make up the mixtures. The less honest of the boiler-compound guild consign each sample of water to the sewer and send the regular goods. Others have a stock analysis which is sent to customers of a given locality, whether it contains iron, lime, or magnesium sulphates or carbonates.

Any expense for softening water in excess of 3 cents per 1,000 gallons is for the privilege of using a ready-made softener. Every superintendent in charge of a plant should insist that the compound used be pronounced by competent authority free from injurious materials, and that it be adapted to the water in use.

Boiler compounds should contain only such ingredients as will neutralize the scale-forming salts present. They should be used only by prescription, so many gallons per 1,000 gallons of feed water. A properly proportioned mixture of soda ought to answer the demands of all plants depending upon that method of softening water in limestone and shale regions.

The honest boiler compounds are, however, useful for small isolated plants, because of the simplicity of their action. For plants of from 75 to 150 horse power two 24-hour settling tanks will answer the purpose of a softening system. Each of these, capable of holding a day's supply, provided with a soda tank in common, and with sludge valves, has paddles for stirring the contents. Large plants are operated on this principle, serving boilers of many thousand horse power. Such a system has an advantage over a continuous system, in that the exact amount of chemical solutions required for softening the particular water can be applied. For some variations of such a system, several companies have secured patents. The fundamental principles, however, have been used for many years and are not patentable.

Prevention of Boiler Scale.—The lime contained in the feed water, either as bicarbonate or as sulphate, is precipitated in the shape of a light mud, but the walls of the boiler remain perfectly bright without being attacked in any manner. While under ordinary atmospheric pressure calcium chromate in solution is precipitated by soda or Glauber's salt as calcium carbonate or as calcium sulphate; the latter is separated under higher pressure by chromates as calcium chromate. An excess of chromates or chromic acid does not exercise any deleterious action upon the metal, nor upon the materials used for packing. By the slight admixture of chromates, two pounds are sufficient for a small boiler for weeks; no injurious ingredients are carried in by the wet steam, the injection water, on the contrary, having been found to be chemically pure.

Protecting Boiler Plates from Scale.—I.—For a 5-horse-power boiler, fed with water which contains calcic sulphate, take catechu, 2 pounds; dextrine, 1 pound; crystallized soda, 2 pounds; potash, ½ pound; cane sugar, ½ pound; alum, ½ pound; gum arabic, ½ pound.

II.—For a boiler of the same size, fed with water which contains lime: Turmeric, 2 pounds; dextrine, 1 pound; sodium bicarbonate, 2 pounds; potash, ½ pound; alum, ½ pound; molasses, ½ pound.

III.—For a boiler of the same size, fed with water which contains iron: Gamboge, 2 pounds; soda, 2 pounds; dextrine, 1 pound; potash, ½ pound; sugar, ½ pound; alum, ½ pound; gum arabic, ½ pound.

IV.—For a boiler of the same size, fed with sea water: Catechu, 2 pounds; Glauber's salt, 2 pounds; dextrine, 2 pounds; alum, ½ pound; gum arabic, ½ pound.

When these preparations are used add 1 quart of water, and in ordinary cases charge the boiler every month; but if the incrustation is very bad, charge every two weeks.

V.—A method which has wide approval for the treatment of water to be used in boilers is the following:

The water to be treated is percolated through a silica gel sold under the name of "Doucil." This material is capable of removing 6 per cent of its weight in lime from the water and its valuable feature lies in the fact that it can be regenerated and used over thousands of times. To regenerate it simply percolate brine water through it. "Doucil" is a sodium aluminum silicate.

VI.—A paint for protecting boiler plates from scale, and patented in Germany, is composed of 10 pounds each of train oil, horse fat, paraffine, and of finely ground zinc white. To this mixture is added 40 pounds of graphite and 10 pounds of soot made together into a paste with 1½ gallons of water, and about a pound of carbolic acid. The horse fat and the zinc oxide make a soap difficult to fuse, which adheres strongly to the plates, and binds the graphite and the soot. The paraffine prevents the water from penetrating the coats. The scale which forms on this application can be detached, it is said, with a wooden mallet, without injuring the paint.

VII.—M. E. Asselin, of Paris, recommends the use of glycerine as a preventive. It increases the solubility of combinations of lime, and especially of the sulphate. It forms with these combinations soluble compounds. When the quantity of lime becomes so great that it can no longer be dissolved, nor form soluble combinations, it is deposited in a gelatinous substance, which never adheres to the surface of the iron plates. The gelatinous substances thus formed are not carried with the steam into the cylinder of the engine. M. Asselin advises the employment of 1 pound of glycerine for every 300 pounds or 400 pounds of coal burnt.

Prevention of Electrolysis.—In order to prevent the eating away of the sheets and tubes by electrolytic action, it has long been the practice of marine engineers to suspend slabs of zinc in their boilers. The zinc, being more susceptible to the electrolytic action than the iron, is eaten away, while the iron remains unimpaired. The use of zinc in this way has been found also to reduce the trouble from boiler scale. Whether it be due to the formation of hydrogen bubbles between the heating surfaces and incipient scale, to the presence in the water of the zinc salts resulting from the dissolution of the zinc, or to whatever cause, it appears to be a general conclusion among those who have used it that the zinc helps the scale, as well as the corrosion. Nobody has ever claimed for it that it prevented the attachment of scale altogether, but the consensus of opinion is that it "helps some."

BOILER PRESSURE.

It hardly pays to reduce pressure on boilers, except in very extreme cases, but if it can be done by throttling before the steam reaches the cylinder of the engine it would be an advantage, because this retains the heat units due to the higher pressure in the steam, and the throttling has a slight superheating effect. As a matter of fact, tests go to show that for light loads and high pressure a throttling engine may do better than an automatic cut-off. The ideal arrangement is to throttle the steam for light loads; for heavier loads, allow the variable cut-off to come into play. This practice has been carried into effect by the design of Mr. E. J. Armstrong, in which he arranges the shaft governor so that there is negative lead up to nearly one-quarter cut-off, after which the lead becomes positive, and this has the effect of throttling the steam for the earlier loads and undoubtedly gives better economy, in addition to making the engine run more quietly.

BONE BLACK:

Bone or Ivory Black.—All bones (and ivory is bone in a sense) consist of a framework of crystallized matter or bone earth, in the interstices of which organic matter is embedded. Hence if

bones are heated red-hot in a closed vessel, the organic matter is destroyed, leaving carbon, in a finely divided state, lodged in the bony framework. If the heat is applied gradually the bone retains its shape, but is quite black and of much less weight than at first. This bone black or animal charcoal is a substance which has great power of absorbing coloring matter from liquids, so that it is largely used for bleaching such liquids. For example, in the vast industry of beet-sugar manufacture the solutions first made are very dark in color, but after filtration through animal charcoal will give colorless crystals on evaporation. Chemical trades require such large quantities of bone charcoal that its production is a large industry in itself. As in breaking up the charred bones a considerable amount of waste is produced, in the form of dust and small grains which cannot be used for bleaching purposes, this waste should be worked up into a pigment. This is done by dissolving out the mineral with hydrochloric acid, and then rinsing and drying the carbon.

The mineral basis of bones consists mainly of the phosphates of lime and magnesia, salts soluble in not too dilute hydrochloric acid. A vat is half filled with the above-mentioned waste, which is then just covered with a mixture of equal volumes of commercial hydrochloric acid and water. As the mineral matter also contains carbonates, a lively effervescence at once ensues, and small quantities of hydrofluoric acid are also formed from the decomposition of calcium fluoride in the bones. Now hydrofluoric acid is a very dangerous substance, as air containing even traces of it is very injurious to the lungs. Hence the addition of hydrochloric acid should be done in the open air, and the vat should be left by itself until the evolution of fumes ceases. A plug is then pulled out at the bottom and the carbon is thoroughly drained. It is then stirred up with water and again drained, when it has fully settled to the bottom. This rinsing with clear water is repeated till all the hydrochloric acid is washed away and only pure carbon remains in the vat. As for pigment-making purposes it is essential that the carbon should be as finely divided as possible, it is as well to grind the washed carbon in an ordinary color mill. Very little power is required for this purpose, as when once the bone earth is removed the carbon particles have little cohesion. The properly ground mass forms a deep-black mud, which can be left to dry or be dried by artificial heat. When dry, the purified bone black is of a pure black and makes a most excellent pigment.

Bone black is put upon the market under all sorts of names, such as ivory black, *ebur ustum*, Frankfort black, neutral black, etc. All these consist of finely ground bone black purified from mineral matter. If leather scraps or dried blood are to be worked up, iron tubes are employed, closed at one end, and with a well-fitting lid with a small hole in it at the other. As these bodies give off large volumes of combustible gas during the charring, it is a good plan to lead the vapors from the hole by a bent tube so that they can be burnt and help to supply the heat required and so save fuel. Leather or blood gives a charcoal which hardly requires treatment with hydrochloric acid, for the amount of mineral salts present is so small that its removal appears superfluous.

BONES, A TEST FOR BROKEN.

Place a stethoscope on one side of the supposed fracture, and a tuning fork on the other. When the latter is vibrated, and there is no breakage, the sound will be heard distinctly through bone and stethoscope. Should any doubt exist, comparison should be made with the same bone on the other side of the body. This test shows the difference in the power of conducting sound possessed by bone and soft tissue.

BONE BLEACHES:

See Ivory.

BONE FAT:

See Fats.

BONE FAT, PURIFICATION AND BLEACHING OF:

See Soap.

BONE POLISHES:

See Polishes.

BONE FERTILIZERS:

See Fertilizers.

BONES, TREATMENT OF, IN MANUFACTURING GLUE:

See Adhesives.

BONE, UNITING GLASS WITH:

See Adhesives.

BOOKS, THEIR HANDLING AND PRESERVATION:

The Preservation of Books in Hot Climates.—Books in hot climates quickly deteriorate unless carefully guarded. There are three destructive agencies: (1) damp, (2) a small black insect, (3) cockroaches.

(1) Books which are kept in a damp atmosphere deteriorate on account of molds and fungi that grow rapidly when the conditions are favorable. Books are best kept on open, airy, well-lighted shelves. When there has been a prolonged spell of moist weather their covers should be wiped, and they should be placed in the sun or before a fire for a few hours. Damp also causes the bindings and leaves of some books to separate.

(2) A small black insect, one-eighth of an inch long and a sixteenth of an inch broad, somewhat resembling a beetle, is very destructive, and books will be found, if left untouched, after a few months to have numerous holes in the covers and leaves. If this insect be allowed plenty of time for its ravages it will make so many holes that bindings originally strong can be easily torn to pieces. All damage may be prevented by coating the covers of books with the varnish described under (3). When books are found to contain the insects they should be well wrapped and placed in the sun before varnishing.

(3) The appearance of a fine binding may be destroyed in a single night by cockroaches. The lettering of the binding may, in two or three days, be completely obliterated.

The following varnishes have been found to prevent effectually the ravages of cockroaches and of all insects that feed upon books:

I.—Dammar resin.....	2	ounces
Mastic.....	2	ounces
Canada balsam.....	1	ounce
Creosote.....	½	ounce
Spirit of wine.....20		fl. ounces

Macerate with occasional shaking for a few days if wanted at once, but for a longer time when possible, as a better varnish will result after a maceration of several months.

II.—Corrosive sublimate, 1 ounce; carbolic acid, 1 ounce; methylated or rum spirit, 1 quart.

Where it is necessary to keep books or paper of any description in boxes, cupboards, or closed bookcases, some naphthalene balls or camphor should be always present with them. If camphor be used it is best to wrap it in paper, otherwise it volatilizes more quickly than is necessary. In dry weather the doors of closed bookcases should be left open occasionally, as a damp, still atmosphere is most favorable for deterioration.

How to Open a Book.—Never force the back of the book. Hold the book with its back on a smooth or covered table; let the front board down, then the other, holding the leaves in one hand while you open a few leaves at the back, then a few at the front, and so on, alternately opening back and front, gently pressing open the sections till you reach the center of the volume. Do this two or three times and you will obtain the best results. Open the volume violently or carelessly in any one place and you will probably break the back or cause a start in the leaves.

BOOK DISINFECTANT:
See Disinfectants.

BOOKS, TO REMOVE FINGER-MARKS FROM:
See Cleaning Preparations and Methods.

BOOKBINDERS' VARNISH:
See Varnishes.

BOOKWORMS:
See Insecticides.

BOOT DRESSINGS:
See Shoe Dressings.

BOOT LUBRICANT:
See Lubricant.

BOOTS, WATERPROOFING:
See Waterproofing.

BORAX FOR SPRINKLING.

I.—Sprinkling borax is not only cheaper, but also dissolves less in soldering than pure borax.

The borax is heated in a metal vessel until it has lost its water of crystallization and mixed with calcined cooking salt and potash—borax, 8 parts; cooking salt, 3 parts; potash, 3 parts. Next it is pounded in a mortar into a fine powder, constituting the sprinkling borax.

II.—Another kind of sprinkling borax is prepared by substituting glass-gall for the potash. Glass-gall is the froth floating on the melted glass, which can be skimmed off.

The borax is either dusted on in powder form from a sprinkling box or stirred with water before use into a thin paste.

BORAX AND BORIC ACID IN FOOD:
See Food.

BORDEAUX MIXTURE:
See Insecticides.

BOROTONIC:
See Dentifrices.

BOTTLE-CAP LACQUER:
See Lacquer.

BOTTLE CLEANERS:
See Cleaning Preparations and Methods, under Miscellaneous Methods.

BOTTLE STOPPERS:
See Stoppers.

BOTTLE VARNISH:
See Varnishes.

BOTTLE WAX:
See Photography.

HYDRAULIC BRAKE FLUID FOR AUTOMOBILES:

The liquid compressant used in the hydraulic brakes of the modern auto consists of equal parts of denatured alcohol and castor oil. The alcohol thins the oil and acts as an anti-freeze. The castor oil lubricates the piston and is the fluid through which the pressure is transmitted.

BRAN, SAWDUST IN.

For the detection of sawdust in bran use a solution of 1 part of phloroglucin in 15 parts of alcohol, 15 parts of water, and 10 parts of syrupy phosphoric acid. Place 2 parts of the solution in a small porcelain dish, add a knifepointful of the bran and heat moderately. Sawdust is dyed red while bran parts only seldom acquire a faint red color. By a microscopic examination of the reddish parts. sawdust will be readily recognized.

Bottles

Magic Bottles.—

The mystery of the "wonderful bottle," from which can be poured in succession port wine, sherry, claret, water, champagne, or ink, at the will of the operator, is easily explained. The materials consist of an ordinary dark-colored pint wine bottle, seven wine glasses of different patterns, and the chemicals described below:

Solution A: A mixture of tincture of ferric chloride, drachms vi; hydrochloric acid, drachms ii.

Solution B: Saturated solution of ammonium sulphocyanide, drachm i.

Solution C: Strong solution of ferric chloride, drachm i.

Solution D: A weak solution of ammonium sulphocyanide.

Solution E: Concentrated solution of lead acetate.

Solution F: Solution of ammonium sulphide, drachm i; or pyrogallic acid, drachm i.

Package G: Pulverized potassium bicarbonate, drachm iss.

Having poured two teaspoonfuls of solution A into the wine bottle, treat the wine glasses with the different solutions, noting and remembering into which glasses the several solutions are placed. Into No. 1 wine glass pour one or two drops of solution B; into No. 2 glass pour one or two drops of solution C; into No. 3 one or two drops of Solution D; leave No. 4 glass empty; into No. 5 glass pour a few drops of Solution E; into No. 6 glass place a few grains of Package G; into No. 7 glass pour a little of solution F.

Request some one to bring you some cold drinking water, and to guarantee that it is pure show that your wine bottle is (practically) empty. Fill it up from the carafe, and having asked the audience whether you shall produce wine or water, milk or ink, etc., you may obtain any of these by pouring a little of the water from the bottle into the prepared glass. Thus No. 1 glass gives a port-wine color; No. 2 gives a sherry color; No. 3 gives a claret color; No. 4 is left empty to prove that the solution in the bottle is colorless; No. 5 produces milk; No. 6, effervescing champagne; No. 7, ink.

Bottle-Capping Mixtures.—

I.—Soak 7 pounds of good gelatin in 10 ounces of glycerine and 60 ounces of water, and heat over a water bath until dissolved, and add any desired color. Pigments may be used, and various tints can be obtained by the use of aniline colors. The resulting compound should be stored in jars. To apply liquefy the mass and dip the cork and portion of the neck of the bottle into the liquid; it sets very quickly.

II.—

Gelatin	1 ounce
Gum arabic	1 ounce
Boric acid	20 grains
Starch	1 ounce
Water	16 fluidounces

Mix the gelatin, gum arabic, and boric acid with 14 fluidounces of cold water, stir occasionally until the gum is dissolved, heat the mixture to boiling, remove the scum, and strain. Also mix the starch intimately with the remainder of the water, and stir this mixture into the hot gelatin mixture until a uniform product results. As noted above, the composition may be tinted with any suitable dye. Before using, it must be softened by the application of heat.

III.—Shellac..... 3 ounces
Venice turpentine 1½ ounces
Boric acid..... 72 grains
Powdered talcum. 3 ounces
Ether..... 6 fluidrams
Alcohol..... 12½ fluidounces

Dissolve the shellac, turpentine, and boric acid in the mixed alcohol and ether, color with a spirit-soluble dye, and add the talcum. During use the mixture must be agitated frequently.

Show Bottles.—

I.—Place in a cylindrical bottle the following liquids in the order named:

First, sulphuric acid, tinted blue with indigo; second, chloroform; third, glycerine, slightly tinted with caramel; fourth, castor oil, colored with alkanet root; fifth, 40-per-cent alcohol, slightly tinted with aniline green; sixth, cod-liver oil, containing 1 per cent of oil of turpentine. The liquids are held in place by force of gravity, and alternate with fluids which are not miscible, so that the strata of layers are clearly defined and do not mingle by diffusion.

II.—Chromic acid..... 1 drachm
Commercial "muriatic" acid..... 2 ounces
Nitric acid..... 2 ounces
Water, enough to make..... 3 gallons

The color is magenta.

The following makes a fine pink for show carboys:

III.—Cobalt oxide..... 2 parts
Nitric acid, c. p..... 1 part
Hydrochloric acid.... 1 part

Mix and dissolve, and to the solution add:

Strongest water of ammonia..... 6 parts
Sulphuric acid..... 1 part
Water, distilled, q. s. to make..... 400 parts

This should be left standing in a dark, cool place for at least a month before putting in the window.

IV.—Green.—Copper sulphate, 300 parts, by weight; hydrochloric acid, 450 parts, by weight; distilled water, to 4,500 parts, by weight.

V.—Blue.—Copper sulphate, 480 parts, by weight; sulphuric acid, 60 parts, by weight; distilled water, to 450 parts, by weight.

VI.—Yellowish Brown.—Potassium dichromate, 120 parts, by weight; nitric acid, 150 parts, by weight; distilled water, to 4,500 parts, by weight.

VII.—Yellow.—Potassium dichromate, 30 parts, by weight; sodium bicarbonate, 225 parts, by weight; distilled water, to 4,500 parts, by weight.

VIII.—Red.—Liquid ferric chloride, officinal, 60 parts, by weight; concentrated ammonium-acetate solution, 120 parts, by weight; acetic acid, 30 per cent, 30 parts, by weight; distilled water, to 9,000 parts, by weight.

IX.—Crimson.—Potassium iodide, 7.5 parts, by weight; iodine, 7.5 parts, by weight; hydrochloric acid, 60 parts, by weight; distilled water, to 4,500 parts, by weight.

All the solutions IV to IX should be filtered. If distilled water be used these solutions should keep for five to ten years. In order to prevent them from freezing, either add 10 per cent of alcohol, or reduce the quantity of water by 10 per cent.

A Cheap and Excellent Warming Bottle.—Mix sodium acetate and sodium hyposulphate in the proportion of 1 part of the former to 9 parts of the latter, and with the mixture fill an earthenware bottle about three-quarters full. Close the vessel well with a cork and place it either in hot water or in the oven, and let remain until the salts within melt. For at least a half day the jug will radiate its heat, and need only be well shaken from time to time to renew its heat-giving energy.

Bottle Deodorizer.—Powdered black mustard seed is successfully employed. Pour a little of it with some lukewarm water into the receptacle, rinsing it afterwards with water. If necessary, repeat the process.

BRANDY AND BRANDY BITTERS

See Wines and Liquors.

Brass

Formulas for the making of Brass will be found under Alloys.

Colors for Polished Brass.—The brass objects are put into boiling solutions composed of different salts, and the intensity of the shade obtained is dependent upon the duration of the immersion. With a solution composed of

Sulphate of copper... 120 grains
Hydrochlorate of ammonia..... 30 grains
Water..... 1 quart

greenish shades are obtained. With the following solution all the shades of brown from orange brown to cinnamon are obtained:

Chlorate of potash...	150 grains
Sulphate of copper...	150 grains
Water.....	1 quart

The following solution gives the brass first a rosy tint and then colors it violet and blue:

Sulphate of copper...	435 grains
Hyposulphite of soda	300 grains
Cream of tartar.....	150 grains
Water.....	1 pint

Upon adding to the last solution

Ammoniacal sulphate of iron.....	300 grains
Hyposulphite of soda	300 grains

there are obtained, according to the duration of the immersion, yellowish, orange, rosy, then bluish shades. Upon polarizing the ebullition the blue tint gives way to yellow, and finally to a pretty gray. Silver, under the same circumstances, becomes very beautifully colored. After a long ebullition in the following solution we obtain a yellow-brown shade, and then a remarkable fire red:

Chlorate of potash...	75 grains
Carbonate of nickel..	30 grains
Salt of nickel.....	75 grains
Water.....	16 ounces

The following solution gives a beautiful, dark-brown color:

Chlorate of potash..	75 grains
Salt of nickel.....	150 grains
Water.....	10 ounces

The following gives, in the first place, a red, which passes to blue, then to pale lilac, and finally to white:

Orpiment.....	75 grains
Crystallized sal sodæ	150 grains
Water.....	10 ounces

The following gives a yellow brown:

Salt of nickel.....	75 grains
Sulphate of copper..	75 grains
Chlorate of potash..	75 grains
Water.....	10 ounces

On mixing the following solutions, sulphur separates and the brass becomes covered with iridescent crystallizations:

I.—Cream of tartar.....	75 grains
Sulphate of copper..	75 grains
Water.....	10 ounces
II.—Hyposulphite of soda	225 grains
Water.....	5 ounces

Upon leaving the brass objects immersed in the following mixture contained in corked vessels they at length acquire a very beautiful blue color:

Hepar of sulphur....	15 grains
Ammonia.....	75 grains
Water.....	4 ounces

Miscellaneous Coloring of Brass.—Yellow to bright red: Dissolve 2 parts native copper carbonate with 1 part caustic soda in 10 parts water. Dip for a few minutes into the liquor, the various shades desired being obtained according to the length of time of the immersion. Green: Dissolve 1 part copper acetate (verdigris), 1 part blue vitriol, and 1 part alum in 10 parts of water and boil the articles therein. Black: For optical articles, photographic apparatus, plates, rings, screws, etc., dissolve 45 parts of malachite (native copper carbonate) in 1,000 parts of sal ammoniac. For use clean and remove the grease from the article by pickling and dip it into the bath until the coating is strong enough. The bath operates better and quicker if heated. Should the oxidation be a failure it should be removed by dipping into the brass pickle.

A verdigris color on brass is produced by treating the articles with dilute acids, acetic acid, or sulphuric acid, and drying.

Brown in all varieties of shades is obtained by immersing the metal in solutions of nitrates or ferric chloride after it has been corroded with dilute nitric acid, cleaned with sand and water, and dried. The strength of the solutions governs the deepness of the resulting color.

Violet is caused by immersing the thoroughly cleaned objects in a solution of ammonium chloride.

Chocolate color results if red ferric oxide is strewn on and burned off, followed by polishing with a small quantity of galena.

Olive green is produced by blackening the surface with a solution of iron in hydrochloric acid, polishing with galena, and coating hot with a lacquer composed of 1 part varnish, 4 parts cincuma, and 1 part gamboge.

A steel-blue coloring is obtained by means of a dilute boiling solution of chloride of arsenic, and a blue one by a treatment with strong hyposulphite of soda. Another formula for bluing brass is: Dissolve 10 parts of antimony chloride in 200 parts of water, and add 30 parts of pure hydrochloric acid. Dip the article until it is well blued, then wash and dry in sawdust.

Black is much used for optical brass articles and is produced by coating with a solution of platinum or auric chloride mixed with nitrate of tin.

Coloring Unpolished Brass.—A yellow color of handsome effect is obtained c[r]

unpolished brass by means of antimony-chloride solution. This is produced by finely powdering gray antimony and boiling it with hydrochloric acid. With formation of hydrogen sulphide a solution of antimony results, which must not be diluted with water, since a white precipitate of antimony oxychloride is immediately formed upon admixture of water. For dilution, completely saturated cooking-salt solution is employed, using for 1 part of antimony chloride 2 parts of salt solution.

Coloring Fluid for Brass.—Caustic soda, 33 parts; water, 24 parts; hydrated carbonate of copper, 5.5 parts.

Dissolve the salt in water and dip the metal in the solution obtained. The intensity of the color will be proportional to the time of immersion. After removing the object from the liquid, rinse with water and dry in sawdust.

Black Color on Brass.—A black or oxidized surface on brass is produced by a solution of carbonate of copper in ammonia. The work is immersed and allowed to remain until the required tint is observed. The carbonate of copper is best used in a plastic condition, as it is then much more easily dissolved. Plastic carbonate of copper may be mixed as follows: Make a solution of blue vitriol (sulphate of copper) in hot water, and add a strong solution of common washing soda to it as long as any precipitate forms. The precipitate is allowed to settle, and the clear liquid is poured off. Hot water is added, and the mass stirred and again allowed to settle. This operation is repeated six or eight times to remove the impurities. After the water has been removed during the last pouring, and nothing is left but an emulsion of the thick plastic carbonate in a small quantity of water, liquid ammonia is added until everything is dissolved and a clear, deep-blue liquid is produced. If too strong, water may be added, but a strong solution is better than a weak one. If it is desired to make the solution from commercial plastic carbonate of copper the following directions may be followed: Dissolve 1 pound of the plastic carbonate of copper in 2 gallons of strong ammonia. This gives the required strength of solution.

The brass which it is desired to blacken is first boiled in a strong potash solution to remove grease and oil, then well rinsed and dipped in the copper solution, which has previously been heated to from 150° to 175° F. This solution, if heated too hot, gives off all the ammonia. The brass is left in the solution until the required tint is produced. The color produced is uniform, black, and tenacious. The brass is rinsed and dried in sawdust. A great variety of effects may be produced by first finishing the brass before blackening, as the oxidizing process does not injure the texture of the metal. A satisfactory finish is produced by first rendering the surface of the brass matt, either by scratch-brush or similar methods, as the black finish thus produced by the copper solution is dead—one of the most pleasing effects of an oxidized surface. Various effects may also be produced by coloring the entire article and then buffing the exposed portions.

The best results in the use of this solution are obtained by the use of the so-called red metals—i. e., those in which the copper predominates. The reason for this is obvious. Ordinary sheet brass consists of about 2 parts of copper and 1 part of zinc, so that the large quantity of the latter somewhat hinders the production of a deep-black surface. Yellow brass is colored black by the solution, but it is well to use some metal having a reddish tint, indicating the presence of a large amount of copper. The varieties of sheet brass known as gilding or bronze work well. Copper also gives excellent results. Where the best results are desired on yellow brass a very light electroplate of copper before the oxidizing works well and gives an excellent black. With the usual articles made of yellow brass this is rarely done, but the oxidation carried out directly.

Black Finish for Brass.—I.—A handsome black finish may be put on brass by the following process: Dissolve in 1,000 parts of ammonia water 45 parts of natural malachite, and in the solution put the object to be blackened, after first having carefully and thoroughly cleaned the same. After letting it stand a short time gradually warm the mixture, examining the article from time to time to ascertain if the color is deep enough. Rinse and let dry.

II.—The blacking of brass may be accomplished by immersing it in the following solution and then heating over a Bunsen burner or a spirit flame: Add a saturated solution of ammonium carbonate to a saturated copper-sulphate solution, until the precipitate resulting in the beginning has almost entirely dissolved. The immersion and heating are repeated until the brass turns dark; then it is brushed and dipped in negative varnish or dull varnish.

To Give a Brown Color to Brass.—I.—In 1,000 parts of rain or distilled water dissolve 5 parts each of verdigris (copper acetate) and ammonium chloride. Let the solution stand 4 hours, then add 1,500 parts of water. Remove the brass to be browned from its attachment to the fixtures and make the surface perfectly bright and smooth and free from grease. Place it over a charcoal fire and heat until it "sizzes" when touched with the dampened finger. The solution is then painted over the surface with a brush or swabbed on with a rag. If one swabbing does not produce a sufficient depth of color, repeat the heating and the application of the liquid until a fine durable brown is produced. For door plates, knobs, and ornamental fixtures generally, this is one of the handsomest as well as the most durable surfaces, and is easily applied.

II.—A very handsome brown may be produced on brass castings by immersing the thoroughly cleaned and dried articles in a warm solution of 15 parts of sodium hydrate and 5 parts of cupric carbonate in 100 parts of water. The metal turns dark yellow, light brown, and finally dark brown, with a greenish shimmer, and, when the desired shade is reached, is taken out of the bath, rinsed, and dried.

III.—Paint the cleaned and dried surface uniformly with a dilute solution of ammonium sulphide. When this coating is dry. it is rubbed over, and then painted with a dilute ammoniacal solution of arsenic sulphide, until the required depth of color is attained. If the results are not satisfactory the painting can be repeated after washing over with ammonia. Prolonged immersion in the second solution produces a grayish-green film, which looks well, and acquires luster when polished with a cloth.

Refinishing Gas Fixtures.—Gas fixtures which have become dirty or tarnished from use may be improved in appearance by painting with bronze paint and then, if a still better finish is required, varnishing after the paint is thoroughly dry with some light-colored varnish that will give a hard and brilliant coating.

If the bronze paint is made up with ordinary varnish it is liable to become discolored from acid which may be present in the varnish. One method proposed for obviating this is to mix the varnish with about five times its volume of spirit of turpentine, add to the mixture dried slaked lime in the proportion of about 40 grains to the pint, agitate well, repeating the agitation several times, and finally allowing the suspended matter to settle and decanting the clear liquid. The object of this is to neutralize any acid which may be present. To determine how effectively this has been done the varnish may be chemically tested.

Steel Blue and Old Silver on Brass.—For the former dissolve 100 parts of carbonic carbonate in 750 parts of ammonia and dilute this solution with distilled water, whereupon the cleaned articles are dipped into the liquid by means of a brass wire. After two to three minutes take them out, rinse in clean water, and dry in sawdust. Old silver on brass is produced as follows: The articles are first silvered and next painted with a thin paste consisting of graphite, 6 parts; pulverized hematite, 1 part; and turpentine. Use a soft brush and dry well; then brush off the powder. Oxidized silver is obtained by dipping the silvered goods into a heated solution of liver of sulphur, 5 parts; ammonia carbonate, 10 parts; and water, 10,000 parts. Only substantially silvered objects are suited for oxidation, as a weak silvering is taken off by this solution. Unsatisfactory coloring is removed with potassium-cyanide solution. It is advisable to lay the articles in hydrogen sulphide-ammonia solution diluted with water, wherein they acquire a blue to a deep-black shade.

Tombac Color on Brass.—This is produced by immersion in a mixture of copper carbonate, 10 parts; caustic soda, 30 parts; water, 200 parts. This layer will only endure wiping with a cloth, not vigorous scouring with sand.

Graining of Brass.—Brass parts of timepieces are frequently provided with a dead grained surface. For this purpose they are fastened with flat-headed pins on cork disks and brushed with a paste of water and finest powdered pumice stone. Next they are thoroughly washed and placed in a solution of 10 quarts of water, 30 grains of mercuric nitrate, and 60 grains of sulphuric acid. In this amalgamating solution the objects become at once covered with a layer of mercury, which forms an amalgam with the copper, while the zinc passes into solution. After the articles have again been washed they are treated with graining powder, which consists of silver powder, tartar, and cooking salt. These substances must be pure, dry, and very finely pulverized. The mixing is done with moderate heat. According

to whether a coarser or finer grain is desired, more cooking salt or more tartar must be contained in the powder. The ordinary proportions are:

Silver powder..	28	28	28 parts
Tartar.....	283	110–140	85 parts
Cooking salt...	900	370	900 parts

This powder is moistened with water and applied to the object. Place the article with the cork support in a flat dish and rub on the paste with a stiff brush while turning the dish incessantly. Gradually fresh portions of graining powder are put on until the desired grain is obtained. These turn out the rounder the more the dish and brush are turned. When the right grain is attained, rinse off with water, and treat the object with a scratch brush, with employment of a decoction of saponaria. The brushes must be moved around in a circle in brushing with the pumice stone, as well as in rubbing on the graining powder and in using the scratch brush. The required silver powder is produced by precipitating a diluted solution of silver nitrate with some strips of sheet copper. The precipitated silver powder is washed out on a paper filter and dried at moderate heat.

The Dead, or Matt, Dip for Brass.—The dead dip is used to impart a satiny or crystalline finish to the surface. The bright dip gives a smooth, shiny, and perfectly even surface, but the dead dip is the most pleasing of any dip finish, and can be used as a base for many secondary finishes.

The dead dip is a mixture of oil of vitriol (sulphuric acid) and aqua fortis (nitric acid) in which there is enough sulphate of zinc (white vitriol) to saturate the solution. It is in the presence of the sulphate of zinc that the essential difference between the bright and the dead dip exists. Without it the dead or matt surface cannot be obtained.

The method generally practiced is to add the sulphate of zinc to the mixed acids (sulphuric and nitric), so that some remains undissolved in the bottom of the vessel. It is found that the sulphate of zinc occurs in small crystals having the appearance of very coarse granulated sugar. These crystals readily settle to the bottom of the vessel and do not do the work of matting properly. If they are finely pulverized the dip is slightly improved, but it is impossible to pulverize such material to a fineness that will do the desired work. The use of sulphate of zinc, then, leaves much to be desired.

The most modern method of making up the dead dip is to produce the sulphate of zinc directly in the solution and in the precipitated form. It is well known that the most finely divided materials are those which are produced by precipitation, and in the dead dip it is very important that the sulphate of zinc shall be finely divided so that it will not immediately settle to the bottom. Therefore it should be precipitated so that when it is mixed with the acids it will not settle immediately. The method of making the sulphate of zinc directly in the solution is as follows:

Take 1 gallon of yellow aqua fortis (38° F.) and place in a stone crock which is surrounded with cold water. The cold water is to keep the heat, formed by the reaction, from evaporating the acid. Add metallic zinc in small pieces until the acid will dissolve no more. The zinc may be in any convenient form—sheet clippings, lumps, granulated, etc., that may be added little by little. If all is added at once it will boil over. When the acid will dissolve no more zinc it will be found that some of the acid has evaporated by the heat, and it will be necessary to add enough fresh acid to make up to the original gallon. When this is done add 1 gallon of strong oil of vitriol. The mixture should be stirred with a wooden paddle while the oil of vitriol is being added.

As the sulphuric acid is being added the solution begins to grow milky, and finally the whole has the consistency of thick cream. This is caused by the sulphuric acid (oil of vitriol) precipitating out the sulphate of zinc. Thus the very finely divided precipitate of sulphate of zinc is formed. If one desires to use known quantities of acid and zinc the following amounts may be taken: Oil of vitriol, 1 gallon; aqua fortis (38° F.), 1 gallon; metallic zinc, 6 ounces.

In dissolving the zinc in the aqua fortis it is necessary to be sure that none remains undissolved in the bottom.

The dead or matt dip is used hot, and, therefore, is kept in a stone crock surrounded with hot water. The articles to be matted are polished and cleaned, and the dip thoroughly stirred with a wooden paddle, so as to bring up the sulphate of zinc which has settled. Dip the work in the solution and allow it to remain until the matt is obtained. This is a point which can be learned only by experience. When the brass article is first introduced there is a rapid action on the surface, but in a few seconds this slows down. Remove the article and rinse and immediately dip into the usual bright dip. This

is necessary for the reason that the dead dip produces a dark coating upon the surface, which, were it left on, would not show the real effect or the color of the metal. The bright dip, however, removes this and exposes the true dead surface.

The usual rule for making up the dead dip is to use equal parts of oil of vitriol and aqua fortis; but these may be altered to suit the case. More oil of vitriol gives a finer matt, while a larger quantity of aqua fortis will give a coarser matt. When the dip becomes old it is unnecessary to add more zinc, as a little goes into the solution each time anything is dipped. After a while, however, the solution becomes loaded with copper salts, and should be thrown away.

A new dip does not work well, and will not give good results when used at once. It is usual to allow it to remain over night, when it will be found to be in a better working condition in the morning. A new dip will frequently refuse to work, and the addition of a little water will often start it. The water must be used sparingly, however, and only when necessary. Water, as a usual thing, spoils a dead dip, and must be avoided. After a while it may be necessary to add a little more aqua fortis, and this may be introduced as desired. Much care is needed in working the dead dip, and it requires constant watching and experience. The chief difficulty in working the dead dip is to match a given article. The only way that it can be done is to "cut and try," and add aqua fortis or oil of vitriol as the case requires.

The dead or matt dip can be obtained only upon brass or German silver; in other words, only on alloys which contain zinc. The best results are obtained upon yellow brass high in zinc.

To Improve Deadened Brass Parts.—Clock parts matted with oilstone and oil, such as the hour wheels, minute wheels, etc., obtain, by mere grinding, a somewhat dull appearance, with a sensitive surface which readily takes spots. This may be improved by preparing the following powder, rubbing a little of it on a buff stick, and treating the deadened parts, which have been cleansed with benzine, by rubbing with slight pressure on cork. This imparts to the articles a handsome, permanent, metallic matt luster. The smoothing powder consists of 2 parts of jewelers' red and 8 parts of lime carbonate, levigated in water, and well dried. Jewelers' red alone may be employed, but this requires some practice and care, especially in the treatment of wheels, because rays are liable to form from the teeth toward the center.

Pickle for Brass.—Stir 10 parts (by weight) of shining soot or snuff, 10 parts of cooking salt, and 10 parts of red tartar with 250 parts of nitric acid, and afterwards add 250 parts of sulphuric acid; or else mix 7 parts of aqua fortis (nitric acid) with 10 parts of English sulphuric acid. For the mixing ratio of the acid, the kind and alloy of the metal should be the guidance, and it is best found out by practical trials. The better the alloy and the less the percentage of zinc or lead, the handsomer will be the color. Genuine bronze, for instance, acquires a golden shade. In order to give brass the appearance of handsome gilding it is often coated with gold varnish by applying same thinly with a brush or sponge and immediately heating the metal over a coal fire.

Pickling Brass to Look Like Gold.—To pickle brass so as to make it resemble gold allow a mixture of 6 parts of chemically pure nitric acid and 1 part of English sulphuric acid to act for some hours upon the surface of the brass; then wash with a warm solution, 20 parts of tartar in 50 parts of water, and rub off neatly with dry sawdust. Then coat the article with the proper varnish.

Pickle for Dipping Brass.—To improve the appearance of brass, tombac, and copper goods, they are usually dipped. For this purpose they are first immersed in diluted oil of vitriol (brown sulphuric acid), proportion, 1 to 10; next in a mixture of 10 parts of red tartar; 10 parts of cooking salt; 250 parts of English sulphuric acid, as well as 250 parts of aqua fortis (only for a moment), rinsing off well in water and drying in sawdust. For obtaining a handsome matt gold color $\frac{1}{20}$ part of zinc vitriol (zinc sulphate) is still added to the pickle.

Restoration of Brass Articles.—The brass articles are first freed from adhering dirt by the use of hot soda lye; if bronzed they are dipped in a highly dilute solution of sulphuric acid and rinsed in clean water. Next they are yellowed in a mixture of nitric acid, 75 parts; sulphuric acid, 100 parts; shining lampblack, 2 parts; cooking salt, 1 part; then rinsed and polished and, to prevent oxidation, coated with a colorless spirit varnish, a celluloid varnish being best for this purpose.

Tempering Brass.—If hammered too brittle brass can be tempered and made